

**ABSTRACT**

The invention relates to a method for the continuous production of aldehydes by the isomerising hydroformylation in a homogenous phase of olefin compositions by means of a synthesis gas, in the presence of a homogeneous rhodium catalyst that is complexed with an organophosphorus ligand containing oxygen atoms and/or nitrogen atoms and a free ligand. The production is carried out at high temperature and high pressure in a multi-stage reaction system consisting of at least two reaction zones. According to the method, the olefin composition is first reacted in a first reaction zone or a group of several first reaction zones at a total pressure of between 10 and 40 bar, using a synthesis gas with a CO/H<sub>2</sub> molar ratio of between 4:1 and 1:2 until a 40 to 95% conversion of the  $\alpha$ -olefins is obtained.